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(71) Applicant (for all designated States except US): BLUESCOPE STEEL LIMITED [AU/AU]; 120 Collins Street, Melbourne, Victoria 3000 (AU).

(72) Inventor; and

(75) Inventor/Applicant (for US only): WHITE, Merrick [AU/AU]; 14 Yorkshire Street, Blackburn, Victoria 3130 (AU).

(74) Agent: GRIFFITH HACK; GPO Box 4164, Sydney, New South Wales 2001 (AU).

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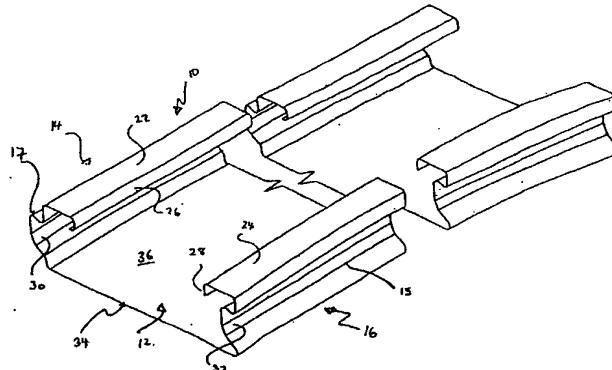
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Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: FORMING APPARATUS FOR PRECAMBERED METAL SECTIONS



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(57) Abstract: A forming apparatus (50) includes a roll former (51) operative to roll form a metal strip (100) to form a profiled metal section (10) of generally C section profile including a pan (12) and a pair of upstanding edge margins (14 and 16). The section profile incorporates a longitudinal camber which is introduced by the forming apparatus by incorporating a prestretching apparatus (52) upstream from the roll former (51), and a bending apparatus (53) located downstream of the roll former (51). The prestretching apparatus differentially stretches the metal strip (100) in its longitudinal direction so as to form portions (101, 102), which are more elongated than a laterally adjacent portion (103) of the strip (100). The differential stretching compensates for longitudinal shortening of the metal strip in forming the profiled section in the roll former (51). The bending apparatus (53) uses a (3) point bending process and includes a reaction stage (60), a fulcrum stage (61), and an action stage (62). The action stage (62) which induces loading onto the profiled section (10) so as to bend the section about the fulcrum stage (61) is incorporated with the shearing assembly. A method of forming a metal section from sheet metal strip is also disclosed. In a further aspect a shearing assembly is disclosed which is height adjustable and which also includes a cutting element (77) and shearing block (78) which are pivotally mounted to an assembly frame (74).

INTERNATIONAL SEARCH REPORT

International application No. PCT/AU2004/000366
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A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. 7: B21B 15/00, 37/56, 37/68, B21D 1/05, 11/12, 13/04, 43/28, B23D 15/04, 17/00, 23/00, 23/02, B26D 1/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPAT (Above IPC marks and keywords: precamber, stretch, shear, profile, angle and like terms)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	AU 10145/02 A (BHP STEEL (JLA) PTY LTD) 18 July 2002 Page 5 lines 25 - 31	1 - 17
A	WO 2002038885 A (BHP STEEL (JLA) PTY LTD) 16 May 2002 (the equivalent of PCT/AU01/01446 mentioned in the description) page 3 lines 16 - 20	1 - 17
A	GB 2045129 A (MANNESMANN DEMAG AG) 29 October 1980 Abstract	1 - 17
A	WO 2002022327 A (SHEAR LLC) 21 March 2002 Abstract, Figure 6	18 - 21
A	GB 1297182 A (SCHLOEMANN AG) 22 November 1972 Figures	18 - 21
A	Derwent Abstract Accession No. 96-137958/14, Class M21, RU 2039638 A (BELO METAL WKS) 20 July 1995 Abstract	18 - 21

Further documents are listed in the continuation of Box C

See patent family annex

* Special categories of cited documents:	
"A"	document defining the general state of the art which is not considered to be of particular relevance
"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E"	earlier application or patent but published on or after the international filing date
"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means
"&"	document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed

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15 June 2004

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01 JUL 2004

Name and mailing address of the ISA/AU
AUSTRALIAN PATENT OFFICE
PO BOX 200, WODEN ACT 2606, AUSTRALIA
E-mail address: pct@ipaustralia.gov.au
Facsimile No. (02) 6285 3929

Authorized officer
JASON PREMNATH
Telephone No : (02) 6283 2127

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2004/000366

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box No. III Observations where unity of invention is lacking (Continuation of Item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

The claims 1 - 17 relate to a method/ apparatus for roll forming a metal section. It is considered that "differentially stretching a metal strip, forming a profiled section and bending the profiled section so as to introduce a longitudinal precamber in the profiled section" comprises the first special technical feature.

The claims 18 - 21 relate to a shearing assembly for use in cutting a profiled metal section. It is considered that "an assembly frame, a shearing block and a cutting element" comprises the second special technical feature.

Since these groups of claims do not share any of the special technical features identified, a technical relationship between the inventions does not exist. Accordingly the claims do not relate to one invention or to a single inventive concept

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU2004/000366

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report			Patent Family Member			
AU	10145/02	CN	1365863			
WO	2002038885	AU	13679/02	AU	23268/02	EP
		WO	0238880			1337723
GB	2045129	DE	2911983	FR	2452336	JP
WO	2002022327	AU	57235/98	AU	90770/01	CA
		EP	1007298	EP	1366844	US
		US	6116131	US	6439089	US
		WO	9828114	WO	02076683	2002157512
GB	1297182	DE	1923203	FR	2047414	
RU	2039638					

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

END OF ANNEX